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Perceived Job Characteristics and Job
Satisfaction: An Examination of
Reciprocal Causation

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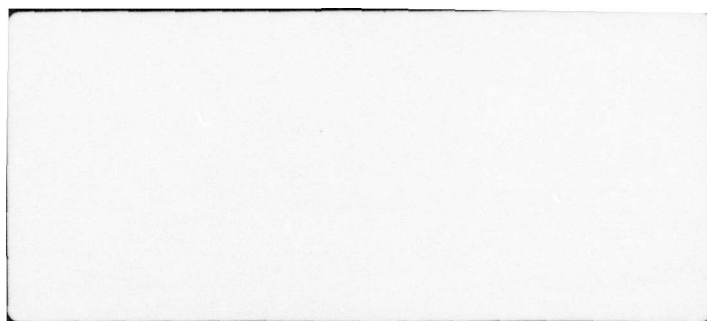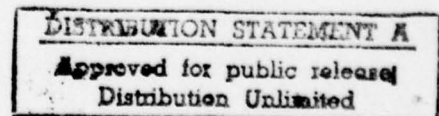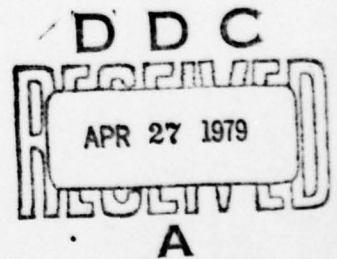| REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

The following four assumptions were tested (a) satisfaction with job/task events and perceptions of job challenge, autonomy, and importance are direct, reciprocal causes of each other; (b) job perceptions are also caused directly by situation attributes, although perceptual distortions resulting for individual dispositions must also be considered; (c) job satisfaction is also cognitive consistent with (i.e., caused by) individual dispositions, although these individual dispositions are

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generally different from those associated with job perceptions; and
(d) individuals rely on job perceptions, and not situational attributes,
for information in formulating job satisfaction attitudes. The assump-
tions were tested on a sample of nonsupervisory subjects ($n = 642$) from
divergent work environments (e.g., production-lines and a computer soft-
ware department). A nonrecursive, structural equation analysis, combined
with tests of logical consistency, supported the assumptions above. The
results were employed to recommend changes in current perspectives regard-
ing perceptual/affective dichotomies and unidirectional causal models
and moderator models that link job perceptions to job satisfaction.

Perceived Job Characteristics and Job Satisfaction:

An Examination of Reciprocal Causation

Theoretical and empirical relationships between individuals' perceptions of job characteristics (e.g., job challenge and autonomy) and job satisfaction have received considerable attention in the literature on job characteristics (Aldag & Brief, 1975; Dunham, 1976; Hackman & Lawler, 1971; Hackman & Oldham, 1975, 1976; Steers & Mowday, 1977; Stone, 1976; Stone, Mowday, & Porter, 1977; Sims & Szilagyi, 1976), job satisfaction (cf. Locke, 1976), and the perceived work environment (climate) (Gavin & Howe, 1975; Gavin & Kelly, 1978; James & Jones, 1974, 1976; LaFollette & Sims, 1975; Payne, Fineman, & Wall, 1976; Payne & Pugh, 1976; Schneider, 1975; Schneider & Snyder, 1975). An integration of these areas suggests the following three generally accepted assumptions.

First, a distinction between descriptive (perceptual, cognitive) and evaluative (affective, emotional) orientations has been employed to differentiate between job perceptions and job satisfaction (see Guion, 1973 and Johannesson, 1973 for exceptions). Second, it is generally assumed that the causal flow is unidirectional, where job perceptions affect job satisfaction, but not vice-versa (Hackman & Oldham, 1975, 1976; Locke, 1976; Schmitt, Coyle, White, & Rauschenberger, 1978; Steers & Mowday, 1977). Third, examinations of the relationships between job perceptions and job satisfaction have often been predicated on moderator models, where for example, it is hypothesized that only individuals with a high need for achievement will be satisfied with challenging jobs.

Unfortunately, the inconsistent or weak empirical support for the moderator

models (Salancik & Pfeffer, 1977; Stone, 1976; Stone et al., 1977; White, 1978) and the growing literature regarding the importance of individual attitudes, values, and other forms of dispositions in the formulation of climate perceptions (James, Hater, Gent, & Bruni, 1978; James & Jones, 1974, 1976; Jones & James, in press) give rise to serious questions about the above assumptions. In particular, James et al. (1978) hypothesized that a reciprocal causation relationship exists between job satisfaction and psychological climate perceptions, which include job perceptions (see below). Not only does a reciprocal causation relationship between job satisfaction and job perceptions question unidirectional causal models, but also it suggests that job perceptions may reflect substantial affective inputs. In addition, logic is presented which suggests that job satisfaction and job perceptions are directly, as well as reciprocally, related.

The objective of the present study is to test the hypothesis of reciprocal causation between job satisfaction and job perceptions. The job perceptions were comprised by challenge, autonomy, and importance, which were viewed as measures of the psychological climate of jobs. This implies that the perceptions (a) are products of higher-order cognitive information processing, and (b) reflect the pyschological significance and meaning of job events to individuals (James et al., 1978; James & Jones, 1976; Jones & James, in press). To illustrate, higher-order job perceptions reflect beliefs (schemas) about the job situation and are based on cognitive associations between lower-order, more descriptively-oriented perceptions (e.g., the repetitiveness of job tasks, the number of opportunities to make job-related decisions, the opinions of others regarding one's job) and psychological events, such as experienced mental challenge, self-determination, and

recognition. That is, awareness of cognitive associations between lower-order, more descriptive perceptions and psychological events allows individuals to process information further and to impute psychological significance and meaning to perceived situational events (Stotland & Canon, 1972). For example, a perception that a job is challenging is thought to be a result of cognitive associations between lower-order perceptions, such as that tasks vary from day to day, and psychological events, such as experienced mental challenge. Similar examples can easily be developed for job autonomy and job importance.[1]

Emphasis is placed on higher-order perceptions because it is generally believed that the primary determinant of an individual's responses to a situation (e.g., attitudes, behaviors) is the psychological significance and meaning that the situation has for that individual (cf. Endler & Magnusson, 1976; Stotland & Canon, 1972). In this context it is also important to note that individual differences in background and previous learning may lead to differences in how events are experienced and in what is judged to be (i.e., perceived as) challenging, autonomous, and important (cf. James et al., 1978; Jones & James, in press; Mahoney, 1977).

Job satisfaction was considered an attitude, namely an affective/emotional evaluation of job events, reflected by a positive emotional state (Ajzen & Fishbein, 1977; Locke, 1976). It is important to note that only satisfaction with job/task events was addressed (e.g., satisfaction with work quality requirements). Satisfaction with other environmental events (e.g., workgroup, pay) was not addressed because the structural (causal) model described below was designed specifically for job perceptions.

The test of the job perception-job satisfaction reciprocal causation hypothesis was based on structural equation methods (cf. James & Singh,

1978), which required introduction of other causes of both the job percep-
tions and job satisfaction. These causes included situational attributes
that should be reflected in job perceptions and individual characteristics
that might serve to influence perceptions and/or attitudes. A structural
(causal) model depicting the hypothesized reciprocal causation between job
perceptions (Y_1) and job satisfaction (Y_2) is presented in Figure 1. Based
on prior research (James et al., 1977; Jones & James, in press), the three
job perception variables were assumed to be correlated and thus were combined
to form one composite. The basic rationale portrayed by the structural
model is summarized as follows.

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Insert Figure 1 about here

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1. _Model parameters_. Figure 1 is a nonrecursive structural model that
applies to one wave of field data (nonrecursive refers to the fact that a
reciprocal causation relationship between Y_1 and Y_2 is assumed). Y_1 and Y_2
are the dependent or endogenous variables in the model, each of which is
viewed as dependent on a set of exogenous variables, represented by variables
labeled with an X. The "$\underline{d}$"s associated with Y_1 and Y_2 are disturbance terms,
and include such things as random shocks, measurement error, and the effects
of other, unmeasured causes of Y_1 and Y_2.

The arrows in Figure 1, both from the $\underline{X}$s to the $\underline{Y}$s and among the $\underline{Y}$s,
represent causal inferences. Associated with each arrow is a structural
parameter (a $\underline{C_{ik}}$ for $\underline{X} \to \underline{Y}$ causal inferences and a $\underline{B_{ij}}$ for reciprocal causal
inferences). The structural parameters assume values that reflect the mean
change in an endogenous variable that is expected to result for each unit

of change in one particular causal variable, assuming all other causal variables are held constant (Darlington & Rom, 1972). Finally, while the $\underline{X}$s may be related, their relationships are not to be explained by this model.

2. <u>Job attributes and workgroup structure are causes of job perceptions</u>. It is logical to assume that job perceptions are in part caused by job and other relevant situational attributes. As shown in Figure 1, five job/structural attributes are hypothesized as causes of the job perceptions. Specifically, the model predicts that individuals will perceive higher levels of job challenge, autonomy, and importance when (a) the jobs performed could be characterized as complex $(\underline{X}_1)$, pressure-producing $(\underline{X}_2)$, and involving boundary-spanning $(\underline{X}_3)$ (Comstock & Scott, 1977; Hage & Aiken, 1969; James & Jones, 1976; Jenkins, Nadler, Lawler, & Cammann, 1975; Jones & James, in press; Mohr, 1971; Rousseau, 1977), and (b) the workgroup structure could be described as low in specialization $(\underline{X}_4 =$ i.e., a low division of labor) and low in standardization of personnel procedures $(\underline{X}_5)$. High specialization suggests that jobs have been reduced to rather routine tasks while high standardization of personnel procedures connotes a lack of autonomy (James & Jones, 1976; Jones & James, in press; Pugh, Hickson, Hinings, & Turner, 1968).

3. <u>Job satisfaction, individual characteristics, and age are causes of job perceptions</u>. It is generally believed that higher-order perceptions are predisposed toward the construction of a subjective reality (i.e., psychological environment or climate) that is compatible with such factors as existing values, beliefs, norms, needs, self-concepts, defense mechanisms, and attitudes (cf. Erdelyi, 1974; James et al., 1978; Jones & Gerard, 1967; Mischel, 1973; Stotland & Canon, 1972). That is, the cognitive processes involved in perception are geared toward increasing, maintaining, or confirm-

ing a psychological climate that is congruent with existing individual dispostions. In a sense, factors such as needs, beliefs, and attitudes reflect the underlying cognitive structure, and their roles in perception are evident in perceptions that display the results of processes such as selective attention, cognitive restructuring, cognitive redefinition, and assimilation (cf. Erdelyi, 1974; Ittleson, Proshansky, Rivlin, & Winkel, 1974; Stotland & Canon, 1972).

Based on the logic above, job satisfaction is viewed as a cause of job perceptions inasmuch as job satisfaction predisposes the individual to construct and maintain a psychological climate that is consistent with existing, or desired, levels of job satisfaction. For example, job satisfaction could influence perceptions of challenge, autonomy, and importance by causing the individual (a) to attend only to selected situational cues in the interest of increasing (or decreasing), maintaining, or confirming existing levels of satisfaction; (b) to impute desirable/undesirable attributes to a job that the individual already regards as satisfying/dissatisfying; (c) cognitively to restructure and redefine situational cues in such a way as to increase the probability that they will be interpreted as satisfying/dissatisfying; and (d) cognitively to restructure the situation to make it consistent with learned expectations as to whether this type of job should be satisfying/dissatisfying (Bandura, 1978; James et al., 1978; Salancik & Pfeffer, 1977, 1978).

Using similar logic, it is proposed that individual characteristics such as higher-order needs (e.g., need for achievement), self-concepts (e.g., self-esteem), and beliefs (e.g., ego-involvement in work) serve as learned cognitive predispositions and therefore are directly and causally linked to

job perceptions. Specifically, it is predicted that individuals will be predisposed to perceive _higher_ levels of job challenge, autonomy, and importance when they (a) have high achievement motivation (X_6), because high achievement motivators tend to place more value on accomplishments when tasks are regarded as moderately demanding (Revelle & Michaels, 1976; Stotland & Canon, 1972); (b) have high self-esteem (X_7), because individuals with high self-esteem are more likely to value challenging tasks that provide opportunities for independent accomplishment (cf. Jones, 1973); (c) possess strong beliefs that challenging jobs are important for personal performance and satisfaction (X_8), which connotes that challenging jobs are valued and are salient to accomplishments and emotions (James et al., 1978; Stotland & Canon, 1972); (d) have high job involvement (X_9), because highly involved individuals tend to be ego-involved in their work and concerned about intrinsic aspects of jobs, such as challenge and autonomy (Rabinowitz & Hall, 1977; Runyon, 1972); and (e) are older (X_{13}), where age is used as a surrogate variable to represent tenure, experience, and, in general, a likelihood to have a higher level of commitment to a particular job and/or organization (Buchanan, 1974; Hall & Schneider, 1972; Hrebiniak, 1974; Steers, 1977).[2]

4. _Job perceptions are causes of job satisfaction._ It is predicted that individuals rely on the subjective, psychological climate represented by psychologically significant and meaningful job perceptions for information in formulating job satisfaction attitudes. This suggests that situational attributes do not affect job satisfaction directly. Rather, it is believed that the formulation of job satisfaction attitudes rests on job perceptions for environmental information, but requires additional stages

of cognitive information processing which result in more personalistic, emotional states that are removed in the information processing sequence from the job/structural attributes.

The model predicts that as a job is perceived as more challenging, autonomous, and important, it is also regarded as more satisfying. The basis for this hypothesis is straightforward when it is assumed that (a) higher-order job perceptions intrinsically involve psychological events such as experienced mental challenge, self-determination, and recognition, and (b) such psychological events are generally desirable to most individuals (i.e., are basic needs). Based on this rationale, job satisfaction is believed to be caused directly by perceptions of challenge, autonomy, and importance, which convey opportunities to satisfy needs for mental challenge, self-determination, and recognition.

It is noteworthy that we predict a direct causal relationship between higher-order job perceptions and job satisfaction. We see no reason to propose that job satisfaction is affected by higher-order job perceptions through intervening mediators such as "psychological growth" (Locke, 1976) or "critical psychological states" (e.g., experienced meaningfulness of work -- Hackman & Oldham, 1975, 1976). Our reasons for this are simply that (a) psychological growth and critical psychological states are reflected by psychological events such as mental challenge, self-detmination, and recognition, and (b) these psychological events are already intrinsic to the perceptual process (i.e., are components of higher-order perceptions). Moreover, we see no reason to assume that individual characteristics such as achievement motivation, self-esteem, and age serve primarily to moderate relationships between higher-order job perceptions and job satisfaction, as

suggested by Hackman and Lawler (1971), Hackman and Oldham (1975, 1976), Katz (1978), and Locke (1976), among others. Our prediction is instead that such variables need not moderate job perception-job satisfaction causal relationships because, as discussed above, these variables are causes of higher-order perceptions.

5. _Job satisfaction is caused by individual characteristics and demo-graphic variables._ Like higher-order perceptions, attitudes are also thought to be predisposed toward increasing, maintaining, or confirming cognitive congruency with more basic values, beliefs, and norms (cf. Rokeach, 1968, 1971). Consequently, it is predicted that individuals will be predisposed to have positive affect toward a job when they (a) have high job involvement (X_9), which implies that individuals who are ego-involved in their work will have a predilection toward evaluating it as satisfying; (b) believe that individuals should comply with conventional work norms and rules of conduct $(X_{10}$; e.g., always obey supervisors), which suggests a predisposition toward positive emotions for a job and organization; and (c) possess personal beliefs that they have a high probability of being promoted (X_{11}), which should affect present levels of job satisfaction because it increases expectancies for psychological growth, status, responsibilities, and justice (Locke, 1976).

Individuals are also considered to be predisposed toward higher levels of satisfaction when they have comparatively lower levels of education (X_{12}). The reason here is that individuals with more education generally tend to require more inducements for satisfaction, have more options in the job mar-ket and thus need not develop high identification with a particular job, and may not feel that their talents are being employed effectively (Hornick et al., 1977; Seybolt, 1976; Steers, 1977; Weaver, 1978). In the present

context, age (X_{13}) was again employed as a surrogate variable, which in effect connoted a greater probability for experiencing satisfying activities as well as a greater propensity to be committed to a particular job and organization.

Summary and Research Strategy

The primary, empirically testable causal hypotheses provided in the points above are as follows:

Hypothesis 1: Satisfaction with job/task events and perceptions of job challenge, autonomy, and importance are reciprocal causes of each other.

Hypothesis 2: Perceptions of job challenge, autonomy, and importance are caused directly by situational attributes, such as job complexity and workgroup structure, and individual characteristics, such as achievement motivation and age.

Hypothesis 3: Job satisfaction is caused directly by individual characteristics, such as job involvement, and demographic variables, including education and age.

Hypothesis 4: Individuals rely on (higher-order) job perceptions rather than actual job/structural attributes for information in the process of formulating job satisfaction attitudes.

These hypotheses have a number of implications. For example, the proposed causal effect of job satisfaction on job perceptions connotes that a descriptive/evaluative dichotomy may not be the most viable basis for distinguishing between job perceptions and job satisfaction (i.e., job perceptions cannot be entirely nonevaluative if they are caused in part by evaluative factors). This must not be construed to mean, however, that job perceptions possess the same degree of affective/emotional involvement as job

satisfaction, or that job perceptions lack descriptive components. In fact, the structural model provides a clear basis for differentiating between the job perception and job satisfaction constructs. To illustrate, job perceptions, but not job satisfaction, are viewed as being caused directly by situational attributes, which suggests that job perceptions are more descriptive than job satisfaction in a comparative sense. Furthermore, the model predicts that (a) whatever causal effect situational attributes have on job satisfaction will be mediated by job perceptions (James et al., 1978; Rousseau, 1978), and (b) job perceptions and job satisfaction have unique, individual characteristic causes.

The primary empirical tests of the structural model (i.e., the causal hypotheses) were based on the use of (a) two-stage least squares (2SLS) to estimate the structural parameters, and (b) the omitted parameters procedure to test the logical consistency (goodness of fit) of the model with the data (cf. James & Singh, 1978). Given that cross-sectional, correlational data were employed, the primary goal of these analyses is to identify and to reject causal hypotheses that appear untenable. On the other hand, if major causal hypotheses are not rejected and if the structural model is shown to be logically consistent with the data, then a meaningful basis for causal inference will have been achieved (Heise, 1975).

METHOD

Sample

The sample was selected to include work environments that differed significantly on job attributes and workgroup structure variables. Five subsamples consisting of nonsupervisory personnel from six organizations were

employed. Descriptions of these subsamples are presented below and in Table 1. Selected data were also obtained from workgroup supervisors, and the overall supervisor sample is described briefly.

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Insert Table 1 about here

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Information systems subsamples. The information systems subsamples included 179 nonsupervisory personnel from a systems design, computer soft- ware department of a large, Western, private health care program. Of these subjects, 126 were employed in high level technical jobs (e.g., systems design, computer programming), and are referred to as the information systems- programming subsample. The remaining 53 subjects were employed in less tech- nical jobs and included computer operators, printers in a small print shop, and secretarial/clerical staff. This subsample is referred to as the infor- mation systems-nonprogramming subsample.

For these and the remaining subsamples (as well as supervisors), parti- cipation in the study was voluntary and confidentiality of answers was assured. Questionnaires were administered by members of the research team with assistance from organizational personnel.

Firefighter subsample. This subsample consisted of front-line fire- fighters from a metropolitan fire department in the Southwest. The fire- fighters worked in groups of four, where three of the four firefighters occupied nonsupervisory positions.

Production subsamples. The remaining two subsamples were employed in four small, paper product manufacturing plants located in different geograph- ical locations in the United States. All plants performed essentially the

functions and were subsidiaries of the same parent corporation. Of the nonsupervisory subjects, 205 performed direct, production-line functions, such as machine operators, packers, and lift-truck operators, and were designated the production-line subsample. The remaining 74 subjects were employed in "white collar" occupations, including salespersons, accountants, and secretarial/clerical staff. This subsample is referred to as the production-line, white collar subsample.

Workgroup supervisors. For each of the five subsamples above, workgroup supervisors provided the job attribute and standardization of structure data, but were not examined for job perceptions or job satisfaction. The return rates for workgroup supervisors (n = 173) were as follows: information systems-programming = 100% (n = 21), information systems-nonprogramming = 100% (n = 8), firefighter = 95% (n = 106), production-line = 100% (n = 23), and production-white collar = 100% (n = 15).

Instruments

Variables are described within the framework of the categories presented in Figure 1. With the exception of the specialization measure, all data were collected by means of questionnaires. Unless specified otherwise, all items employed either singly or within item composites were measured on five-point Likert scales or Likert-type scales (e.g., 1 = Practically never ... 5 = Almost always). The number of items in each composite, indicators of internal consistency (coefficient alpha, interitem or average interitem correlation), and the level of analysis on which the data were collected are presented in Table 2.[3] Three levels of analysis were represented in the data. With the exception of missing data, these were "individuals," namely nonsupervisory subjects (n = 746), unique job-types (n = 446), and workgroups (n = 173),

where, as noted above, supervisors provided the job-type and workgroup data.

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Insert Table 2 about here

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Endogenous Variables

Job perceptions. The job perception measures included the three dimensions of job challenge, job autonomy, and job importance. Items representing these dimensions were based on prior research on job/task perceptions (Dunham, 1976; Hackman & Lawler, 1971; Hackman & Oldham, 1975, 1976; Sims, Szilagyi, & Keller, 1975; Turner & Lawrence, 1965), and climate research (Hornick et al., 1977; James et al., 1977; Jones & James, in press). Job challenge measured the extent to which the job was seen as providing the individual with opportunities to employ his/her skills and abilities, to work on challenging and creative problems, and to engage in a wide range of job behaviors. Job autonomy reflected the extent to which individuals perceived themselves as free to determine the nature of the tasks or problems to be worked on and courses of action to be employed. Job importance focused on the degree to which individuals perceived that their jobs made meaningful contributions and were important to the organization.[4]

The average intercorrelation among the three composites was .45. In addition, these composites defined one principal component in a (principal) components analysis of the 16 climate composites included in the overall investigation (which included role, leadership, group, and organizational climate composites). These results supported the decision to combine the three composites to form one, overall job perception score.

Job satisfaction. The job satisfaction composite was based on items associated directly with job and task events. The items have been used extensively in past research (cf. Hackman & Lawler, 1971), and included satisfaction with opportunities for independent thought and action, work quality requirements, time given to complete work, and amount of authority to carry out responsibilities. The scale for each item was 1 = Strongly dissatisfied ... 5 = Strongly satisfied. A components analysis demonstrated that the items were unifactorial, and thus the items were combined to form one composite. (It should also be mentioned that the selection of job satisfaction items, as well as all other items in the questionnaires, was based in part on reviews by and recommendations from members of the organizations studied.)

Exogenous Variables

Job attributes and workgroup structure. Emphasis was placed on measures of the "proximal work environment" (i.e., jobs and workgroups) because it presumably has the most direct and immediate ties to individuals' work experiences (Indik, 1968; James & Jones, 1976; Jones & James, in press; Lawler, Hall, & Oldham, 1974; Newman, 1975). Supervisors provided these data in an attempt to avoid methodological confounding between measures of situational attributes and subordinates' job perceptions. This does not imply that supervisors provided totally accurate or objective descriptions of the situational attributes, and the construct validity of these measures is addressed in the analyses.

The three job attribute variables were predicated on workgroup supervisors' descriptions of each unique job-type in their workgroups. Items were developed based on research by Jones and James (in press) and Jenkins et al.

(1975). Job complexity was represented by items such as "This job requires the use of sophisticated and complex skills," while a job pressure item was "This job frequently requires excessive amounts of work." Boundary-spanning measured the extent to which the job required the incumbent to work with individuals (a) from other parts of the same organization, and (b) from outside the organization.

Specialization was measured by a frequency count of the number of different job-types in a workgroup, following a review of organizational records and job descriptions. Standardization of personnel procedures was based on workgroup supervisors' descriptions of the degree to which procedures for reporting workgroup performance and efficiency, inspections, and disciplinary actions were standardized (Jones & James, in press). The scale was: 1 = Minimal standardization of procedures, opportunity for changes in most procedures ... 4 = Maximum standardization of procedures, no opportunities for change.

Individual characteristics and demographic variables. Achievement motivation was designed to measure orientation toward success. Items included measures of need for achievement, preference for achievement-oriented activities, aspiration level, and persistence (Fries & Knox, 1972; Hermans, 1970; Mehrabian, 1968; Steers & Braunstein, 1976). Self-esteem included both general manifestations of self-esteem (e.g., I feel that I have a number of good qualities) and general self-confidence in the work setting (e.g., My ability gives me an advantage in my current job). Items were adopted from existing self-esteem scales (Hunt, Singer, & Cobb, 1967; Rosenberg, 1965), a self-rated ability scale (Dieterly & Schneider, 1974), and, based on results of a components analysis, two items from an internal control scale (Levenson, 1974).

The importance rating of job challenge assessed whether an individual possessed beliefs that a job (not necessarily the present job) with challenge and variety was important for "doing your job well," and "feeling satisfied with your job." A four-point, Likert-type scale was employed (1 = Not at all ... 4 = Extremely important). Job involvement was based on items presented by Lawler & Hall (1970) and was designed to measure the degree to which individuals cognitively related their jobs to their self-esteem (Lodahl & Kejner, 1965). Compliance assessed the degree of personal endorsement of conventional work norms and values (Crutchfield, 1955: Scott, 1965). The items measured the extent of personal approval for behaving properly and being well-mannered at work, acting respectfully toward supervisors, obeying supervisors' instructions, following organizational policies and procedures, and finishing jobs on time. A high score suggested that compliance with conventional work norms was a component of the individual's internal self-rule, or self-regulatory, system (cf. Bandura, 1977: Bowers. 1973).

Probability of promotion was based on the item "I feel that the probability of a major promotion for me in this organization is: 1 = Very low ... 5 = Very high." Education was measured by self-reported number of years in school, while age was based on self-reported year of birth.

Methodological Rationale

Actual statistical procedures are described simultaneously with the presentation of results. In this section, methodological rationale is presented with respect to the sample employed for analytic purposes, the level of analysis, assumptions required to conduct the 2SLS analysis, and the use of standardized regression weights as estimates of the structural parameters.

Analytic sample. Analyses were conducted on nonsupervisory subjects who had complete data on all variables studied, including data provided by supervisors. This decision was predicated on the desire to avoid biasing statistical results as a function of estimating missing data. 642 out of 746 subjects had complete data, and no meaningful differences were found between the 642 subjects who were included in the analyses and the 104 subjects who were not included.

Level of analysis. The desired level of analysis was the sample of 642 nonsupervisory subjects inasmuch as causes for individuals' perceptions and attitudes were of primary interest. To achieve this desired level of analysis for **all** variables, it was necessary to disaggregate the job attribute (n = 446 jobs) and workgroup structure (n = 173 workgroups) data. Disaggregation was accomplished by simply assigning the appropriate job attribute or workgroup structure scores to all subjects in the same job type or workgroup. An important advantage provided by conducting all analyses at the individual level of analysis was the opportunity to compare directly results from different analyses. However, it should be noted that the means, standard deviations, and F-tests for, and the intercorrelations among, the disaggregated variables (X_1 through X_5) may not reflect accurately the distributional properties, differences, and relationships for these variables at job/workgroup levels of analyses (i.e., before disaggregation).

Assumptions required by 2SLS. 2SLS is extremely demanding with respect to assumptions. In practice, however, it is common to allow for some slippage in the assumptions as long as such slippage does not seriously question the validity of the results (cf. Duncan, 1975, Fisher, 1971; James & Singh, 1978). Consequently, the pragmatic assumptions required to conduct 2SLS are discussed.

Of initial importance is the assumption of an equilibrium-type condition; this requires that (a) the causal effects have been relatively rapid, (b) the system of relationships among the variables in the model has reached a state of temporary stability, and (c) the directions of causal flow are correctly specified for at least relatively short time periods (Miller, 1971). Given that cognitive processes tend to occur rapidly (James et al., 1978) and that the vast majority of subjects had been employed for at least six months, assumptions "a" and "b" were considered to have been reasonably satisfied. With respect to assumption "c", it is postulated that while the $\underline{X}$s generally had immediate effects on the $\underline{Y}$s, over relatively short time periods (e.g., 6 to 8 months), the $\underline{Y}$s did not causally affect the $\underline{X}$s. For example, individual characteristics such as needs, beliefs, self-concepts, and norms are regarded as relatively enduring and stable components of personality, and, in comparison to perceptions and attitudes, are far less subject to change as a function of short-term fluctuations in situations (Alker, 1972; Jones & Gerard, 1967; Lodahl & Kejner, 1965; Rokeach, 1968, 1971; Rotter, 1966; Stotland & Canon, 1972; Stagner, 1976, 1977). Consequently, it was assumed that job perceptions and attitudes were not likely to affect these individual characteristics over relatively short time periods. Similar logic applies to the situational attributes, where it was assumed that job perceptions and attitudes did not affect job/structural characteristics over relatively short time periods.

The rationale above provides reasonable satisfaction of assumption "c". It is important to note that no assumptions are required or made concerning relatively long time periods, where it is quite possible for perceptions and attitudes to affect personality as well as job/structure characteristics (cf. Endler & Magnusson, 1976; Kohn & Schooler, 1973).

It was also assumed that in the population (a) the causal effects were linear and additive (examinations of sample distributions indicated that relationships were approximately linear); (b) the variables had been measured on scales that had at least some interval qualities; (c) the variables had reasonably high reliabilities, which was considered to be the case for all variables given that coefficient alpha and interitem and average interitem correlations are conservative indicators of reliability (Lord & Norvick, 1968); and (d) the (population) disturbance terms were normally distributed with an expected value of zero.

An additional assumption that could not be made directly was that in the population the exogenous variables were uncorrelated with unmeasured causes of Y_1 and Y_2. This assumption is impossible to meet in practice if for no other reason than that all relevant causes of an endogenous variable are not likely to be known, much less measured (James & Singh, 1978). On the other hand, it was assumed that important exogenous causes of Y_1 and Y_2 were represented by the measured variables, and that the remaining unmeasured causes of Y_1 and Y_2 would fit into one or more of the following categories (a) approximate linear dependence on the measured variables, (b) low correlations with the measured variables, and (c) relatively weak causal effects. Thus, while it could not be assumed that the exogenous variables were uncorrelated with unmeasured causes, it did appear reasonable to assume that violations of this assumption did not seriously question the results.

Standardized versus unstandardized regression weights. Standardized or unstandardized regression weights may be used to estimate structural parameters, but for reaons discussed elsewhere, the use of unstandardized regression weights has been recommended (cf. Blalock, 1967; Tukey, 1964; Wright, 1960). However, unstandardized regression weights are not as easily interpreted as are standardized weights, and

thus standardized weights were preferred for reporting purposes. In the present study, the results were directly comparable for both standardized and unstandardized regression weights, and only the standardized weights are reported.

RESULTS

Results are presented in the following order: (1) examinations of differences among the subsamples, (2) correlations among the variables studied, (3) results of the 2SLS analysis, and (4) tests of logical consistency. All analyses were based on the nonsupervisory subject (i.e., individual) level of analysis, as explained earlier.

Differences Among Subsamples

As shown in Table 1, the five nonsupervisory subsamples differed significantly on the job attribute and workgroup structure variables. In general, the average nonsupervisory employee in the information systems-programming subsample worked in the most technologically advanced environments and had the lowest levels of structural specialization and standardization. Members of the firefighter and production-white collar subsamples appeared to work in environments with, comparatively, intermediate levels of technology and structure. The work environments for the average member of the information systems-nonprogramming and the production-line subsamples could be characterized as relatively low in technology and high in structure.

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Insert Table 3 about here

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These descriptive data provided a partial but nevertheless important

basis for suggesting that the job/structure variables possessed sufficient construct validity to be regarded as situational attributes in this study. That is, the job/structure variables differentiated meaningfully among sub-samples selected originally to represent differences in job technologies and workgroup structures. Additional evidence of the construct validity of job/structure variables is presented below, where it is indicated that these variables were not influenced, at least strongly, by method variance (correlation analysis) and performed as predicted (structural equation analysis). Thus, support was found to regard the job/structure measures as situational variables in this study.

The subsamples also differed significantly with respect to job percep-tions, job satisfaction, individual characteristics, and demographics. This was not unexpected given that organizational and self-selection factors are involved in occupational decisions and the job perceptions were assumed to be related to job/structural attributes. On the other hand, the magnitudes of the omega-squares suggested that most of these variables were not associ-ated highly with subsample differences. In particular, very little of the variance in job satisfaction and the majority of the individual character-istic/demographic variables was accounted for by subsample differences.

Correlations Among Variables

All remaining analyses were conducted on the total sample of 642 non-supervisory subjects in order to maximize variation on the variables, especially the job attribute/structure variables and the job perceptions. Correlations among the variables are shown in Table 4. The correlations are presented primarily as a frame of reference for interpreting the results of the structural equation analysis, and are summarized in the following six

points. Concerns regarding method variance are also addressed.

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Insert Table 4 about here

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1. The endogenous variables were highly correlated (r = .58, p < .01).

2. Correlations among the job attributes and between these attributes and specialization were moderate and significant (absolute values of .21 to .46, p < .01), while standardization had generally low relationships with the above variables. The latter set of relationships indicated the general absence of contamination due to method variance inasmuch as the job attributes and standardization were measured in the same survey.

3. Job perceptions were significantly and often moderately correlated with the job/structure variables, while job satisfaction had low, but significant in three cases, correlations with these same variables. Without exception, however, the job perception-situational variable correlations were significantly (p < .01) larger than the job satisfaction-situational variable correlations. These results were consistent with the logic that job satisfaction was further removed than job perceptions from situational events.

4. The individual characteristic/demographic variables were, with few exceptions, significantly correlated, and a number of the correlations were moderate in magnitude. On the other hand, no two variables could be regarded as collinear, and the number of correlations $\leq |\pm .20|$ suggested that contamination due to method variance was minimal.

5. With two exceptions, correlations between the situational variables and the individual characteristic/demographic variables were low (i.e., $\leq |\pm .20|$). The implications of these results were that (a) the situational

and individual characteristic/demographic variables would have relatively independent influences on the endogenous variables, and (b) needs, values, beliefs, norms, and self-concepts may not be highly, or even moderately, susceptible to change as a function of at least recent job experiences.

6. Both the job perceptions and job satisfaction were significantly correlated with many of the individual characteristic/demographic variables. The patterns of correlations, however, tended to support the predictions of the structural model. For example, job satisfaction had much lower correlations than the job perceptions with variables that were predicted to be unique causes of the job perceptions (i.e., $\underline{X}_6$, $\underline{X}_7$, and $\underline{X}_8$).

Results of 2SLS Analysis

The 2SLS procedure is designed to provide consistent, and generally asymptotically unbiased, estimates of the population structural parameters (the $\underline{B}_{ij}$s and $\underline{C}_{ik}$s). Explanations of 2SLS procedures are available in the literature (cf. Duncan, 1975; James & Singh, 1978; Namboodiri, Carter, & Blalock, 1975); the present results are reported with only brief discussions of procedures.

The initial step in the 2SLS analysis is the design of a structural equation for each endogenous variable. In standard score form, these equations were as follows (lower-case $\underline{x}$s and $\underline{y}$s represent standardized variables):

$$\underline{y}_1 = \underline{B}_{12}\,\underline{y}_2 + \underline{C}_{11}\,\underline{x}_1 + \cdots + \underline{C}_{19}\,\underline{x}_9 + \underline{C}_{113}\,\underline{x}_{13} + \underline{d}_1 \tag{1}$$

$$\underline{y}_2 = \underline{B}_{21}\,\underline{y}_1 + \underline{C}_{29}\,\underline{x}_9 + \cdots + \underline{C}_{213}\,\underline{x}_{13} + \underline{d}_2 \tag{2}$$

The coefficients in the equations are the population structural parameters, and each equation includes those variables in Figure 1, either endogenous or

exogenous, that had a direct causal relationship with the dependent (endogenous) variable.

Both Equation 1 and Equation 2 are "overidentified"; that is, more than sufficient information was available to obtain unique mathematical estimates of the structural parameters (Fisher, 1971: Theil, 1971). However, it was not possible to estimate the parameters directly because it was assumed, in accordance with standard practice, that the reciprocally related variables (y_1 and y_2) were correlated with unmeasured causes of each other (cf. James & Singh, 1978). To obtain consistent estimates of B_{12} and B_{21}, it is necessary first to purge y_1 and y_2 of their correlations with such causes. This is accomplished by the first-stage of 2SLS, in which y_1 and y_2 are each regressed on all of the exogenous variables, using ordinary least square (OLS). The created scores provided by the first-stage regressions, $\hat{y}_1$ and $\hat{y}_2$, are unrelated to (pragmatically, have low relationships with) unmeasured causes. This is explained by the fact that $\hat{y}_1$ and $\hat{y}_2$ are functions of exogenous variables that, by assumption are unrelated to (have low relationships with) unmeasured causes of y_1 and y_2 (see the earlier stated assumptions for 2SLS).

The multiple correlations resulting from the first-stage OLS analyses were .59 for y_1 and .55 for y_2. These indicated that significant and meaningful proportions of the variance in y_1 and y_2 had been accounted for by the exogenous variables.

The second-stage of 2SLS was conducted after replacing y_2 (Equation 1) and y_1 (Equation 2) with the predicted $\hat{y}_2$ and $\hat{y}_1$ scores from the first-stage regressions. In the sample, the second-stage equations were as follows:

$$y_1 = \tilde{B}_{12} \hat{y}_2 + c_{11} x_1 + \dots + c_{19} x_9 + c_{113} x_{13} + e_1 \tag{3}$$

$$y_2 = \tilde{B}_{21} \hat{y}_1 + c_{29} x_9 + \ldots + c_{213} x_{13} + e_2 \tag{4}$$

where the variables are in standardized form, the $\tilde{B}_{ij}$ and the c_{ik} are standardized regression weights as well as sample estimates of the populattion structural parameters in Equations 1 and 2, and the e_i are residual (error) terms. The second-stage estimates were obtained by separate applications of OLS, and adjustments were made in the residual terms and standardized regression weights based on procedures recommended by Hout (1977).

The second-stage multiple correlations, which in 2SLS are primarily heuristic values (cf. Johnston, 1972), were .58 for y_1 and .59 for y_2. The estimated values of the structural parameters are presented in Table 5. A summary of this information is as follows.

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Insert Table 5 about here

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1. Both $\tilde{B}_{12}$ and $\tilde{B}_{21}$ were significant (.34 and .14, respectively; $p < .01$), indicating that job perceptions and job satisfaction could be considered reciprocal causes of each other.

2. With respect to the other presumed causes of the job perceptions, the estimates of the structural parameters were significant and in predicted directions for two of the three job attributes (job complexity and job pressure), both workgroup structure variables (specialization and standardization), and two of the five individual characteristics (achievment motivation and self-esteem). The failure of the regression weights for x_3, x_8, x_9, and x_{13} to reach significance connoted that these variables did not contribute uniquely to the occurrence of y_1. That is, whatever causal effect these variables had on the job perceptions was already accounted for (i.e.,

controlled) by other variables in the structural equation. Finally, $\tilde{B}_{12}$ was substantially larger than any of the other estimated structural parameters for y_1. This implied that job satisfaction was the most important cause of the job perceptions among the variables in the structural equation. It should also be mentioned that a review of the error terms for the weights indicated that multicollinearity was not a problem.

3. With respect to the other presumed causes of job satisfaction, the estimated values of the structural parameters were, without exception, significant and in the predicted directions. As above, no evidence of multicollinearity was apparent. However, in contrast to the results for y_1, the job perceptions did not appear to be the most important cause of job satisfaction, although differences in the weights were small and not substantively meaningful.

In general, the results of the 2SLS analysis supported the structural model presented in Figure 1. It was possible, however to conduct additional analyses to test whether this structural model was logically consistent with the data. It is important to note that failure to pass logical consistency tests connotes that the structural model is untenable, regardless of the results of the 2SLS analysis.

Tests of Logical Consistency

In accordance with recommendations from a number of authors (Duncan, 1975; James & Singh, 1978; Namboodiri et al., 1975), the omitted parameters procedure was employed to conduct the logical consistency tests. Unfortunately, severe multicollinearity problems were encountered. Consequently, a variant of the omitted parameters procedure, presented by James and Singh (1978) and Miller (1971), was employed.

The logic of this procedure can be illustrated as follows. It was assumed in the development of the structural model that neither the job/structure variables (X_1 through X_5) nor achievement motivation, self-esteem, and importance of job challenge (X_6 through X_8) causally affect job satisfaction (Y_2) directly. The logical consistency of these assumptions was tested by regressing the second-stage residual for job satisfaction (i.e., e_2 in Equation 4) on exogenous variables X_1 through X_8, using OLS. The resulting standardized regression weights are estimates of structural parameters C_{21} through C_{28}. Note that if a given estimate of a structural parameter (c_{ik}, $i = 2$, $k = 1 \ldots 8$) is not significantly different from zero, then it can be inferred that the corresponding exogenous variable was not related directly to job satisfaction. On the other hand, if one or more of the c_{ik} were signficant, then the original structural model would have to be rejected because it was not logically consistent with the data. For example, if c_{21} were significant, then it would be inferred that job complexity affected job satisfaction directly, and the structural model was misspecified (i.e., failed to contain this causal association). Using similar logic, the regression of the second-stage residual for job perceptions (i.e., e_1 in Equation 3) on compliance, probability of promotion, and education (X_{10} through X_{12}) tests the logical consistency of the assumptions that these variables do not affect job perceptions directly. That is, logical consistency would be demonstrated if c_{110}, c_{111}, and c_{112} were not significantly different from zero.

The simplifying assumption was made that an exogenous variable which failed to have a significant correlation with an endogenous variable would also not have a significant, direct causal effect on that endogenous variable in the tests of logical consistency. Based on this logic and nonsigni-

ficant, zero-order correlations presented in Table 4, it was possible to delete (a) variables X_3, X_5, and X_8 from the logical consistency test for job satisfaction, and (b) variable X_{12} from the logical consistency test for job perceptions.

The results of the logical consistency tests are presented in Tables 6 and 7. Only two estimated values of the structural parameters were significant, namely the estimated values for C_{110} in Table 6 and C_{26} in Table 7. However, these estimates are opposite in sign to the zero-order correlations between the exogenous and endogenous variables (correlations were reproduced for comparison purposes). This indicated that x_{10} and x_6 functioned as suppressors. This is important here because it suggests that while x_{10} and x_6 suppressed variance in other independent variables that was unrelated to the endogenous variables, x_{10} was not related directly to y_1, nor was x_6 related directly to y_2. It could, therefore, be concluded that the results presented in Tables 6 and 7 indicated that none of the exogenous variables had direct causal effects on the endogenous variables for the relationships studied. These findings argue that the original structural model presented in Figure 1 was logically consistent (i.e., had a good fit) with the data. Substantively, the results indicated that job satisfaction was not affected directly by any of the job/structure variables or the individual characteristics that were assumed to be unique causes of the job perceptions. In a like manner, it was indicated that the job perceptions were not affected directly by any individual characteristics that were postulated as unique causes of job satisfaction.

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Insert Tables 6 and 7 about here

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DISCUSSION

The results of the 2SLS analysis and the tests of logical consistency generally supported the hypotheses derived earlier, although there were several areas of concern. For example, while the second-stage, heuristic multiple correlations of .58 and .59 were within the range of published indices in other areas of the social sciences, and connoted that variables of major causal significance had been included in the structural equations, it was also clear that other, unmeasured causes exist for both endogenous variables. Thus, the explanatory power of the structural model could be enhanced by the addition of other causal variables for the job perceptions and job satisfaction, although for reasons stated earlier, this does not necessarily suggest that the results of the present study are invalid. Of further interest was the fact that many of the significant, second-stage parameter estimates (standardized regression weights) were of low magnitude. However, large standardized regression weights were not expected inasmuch as multiple sources of causation were assumed. In addition, each weight re-flected controls for all other causal variables in a structural equation, a relatively large number of variables was employed, and the variables in each equation were generally intercorrelated. Thus, it is suggested that (signi-ficant) standardized weights as low as .08 could be regarded as "meaningful" (cf. Billings & Wroten, 1978; Land, 1969).

Another point of concern is that it is generally believed that struc-tural models are neither unique nor unassailably correct (cf. Duncan, 1975). For one reason, it is almost always possible to propose new variables to test in a model. Furthermore, it is generally impossible to test all the assumptions for 2SLS in one study. In particular, some degree of ambiguity

in the causal ordering among variables is typically intrinsic to, but often untestable in, cross-sectional, nonrecursive models. Thus, it is commonly stipulated that other, untested structural models might fit the same data at least equally well (James & Singh, 1978).

On the other hand, the present study satisfied two criteria considered critical for drawing causal inferences from causal analysis (cf. Heise, 1975; James & Singh, 1978: Young, 1977). First, the structural model had a strong theoretical base; that is, it was predicated on basic postulates from perceptual/cognitive information processing theories, interactional psychology, cognitive social learning theory, and psychological climate (James et al., 1978). Second, the results of the 2SLS analysis and the tests of logical consistency demonstrated that the relationships of special inter- est, the reciprocal causation between the endogenous variables, as well as the larger system of relationships (e.g., other causes for the endogenous variables) behaved consistently with regard to expectations (i.e., the theory). Consequently, it was concluded that a meaningful base had been established on which to draw causal inferences.

The remainder of this section is devoted to a discussion of such causal inferences and their implications for future theoretical and empirical pur- suits involving job perceptions and job satisfaction. Given the general sup- port of the structural model presented in Figure 1, the rationale (hypotheses) employed to develop this model formed the basis for the inferences. The discussion of the causal inferences was simplified by deleting all nonsigni- ficant causal associations, which is a form of theory trimming of the struc- tural model (Heise, 1969).

Causes of Job Perceptions

Job challenge, autonomy, and importance were described as higher-order perceptions that reflected multiple sources of causation and the results of various forms of perceptual/cognitive processing and interpretation. Based on this rationale, it was predicted that the job perceptions would be predisposed toward the construction of a subjective reality (psychological climate) that is compatible with existing individual characteristics and attitudes (Hypotheses 1 and 2). Results provided meaningful support for these predictions; it was indicated that the job perceptions were influenced causally and positively by job satisfaction, achievement motivation, and self-esteem. It was also indicated that, among the variables studied, job satisfaction was the most salient cause of the job perceptions.

In further support of Hypothesis 2, the results substantiated assumptions that job perceptions are influenced causally and positively by higher levels of job complexity and job pressure, and lower levels of specialization and standardization. This suggests that job perceptions are at least "partially descriptive" in the sense that they were caused, in part, by situational attributes. On the other hand, it would be a rather serious error to assume that the job perceptions reflected veridical descriptions of job environments inasmuch as individual difference variables (e.g., job satisfaction) made unique contributions to the job perceptions, and the magnitudes of structural parameter estimates for the situational attributes were certainly not overwhelming.

The comparatively large magnitude of the estimated job satisfaction → job perception causal association (i.e., $\underline{\overset{\frown}{B}}_{12}$ = .34) requires further discussion since this causal relation is the key to the reciprocal causation

hypothesis. The concept that attitudes are a critical factor in the formulation of perceptions is neither new nor unique to many areas of psychology (cf. James et al., 1978). For example, social psychologists have long held that attitudes serve a central function in organizing knowledge and behaviors (Katz, 1960; Smith, Bruner, & White, 1956). Attitude theorists have generally operated from a theoretical point of view that draws conceptual distinctions among the cognitive (i.e., descriptive or belief) and affective (evaluative) components of attitudes, but which considers the components to be dynamically related (James & Jones, 1974; Triandis, 1971; Rosenberg & Hovland, 1960). Furthermore, attitude theorists often postulate a basic need or desire for consistency among cognitive and affective components as a crucial underlying principle of cognitive functioning, thus strengthening the dynamic relationships among the components. For example, as discussed by Fishbein and Ajzen (1975), it is often assumed that perceptions that are generally consistent with current belief and attitude systems will be easily assimilated into the existing cognitive system, whereas perceptions that are inconsistent will be distorted, rejected, or avoided.

Fishbein and Ajzen (1975) noted further that the likelihood for perceptual distortion differs somewhat for different kinds of beliefs. For example, descriptive beliefs (i.e., descriptions of direct experiences with an attitude object) have a greater likelihood of being veridical than inferential beliefs (i.e., beliefs that go beyond simple description), which have a greater probability of being distorted by individual filters. The results of this study are consistent with this logic inasmuch as (a) the job perceptions were not veridical, and (b) the job perceptions were designed to measure inferential beliefs (i.e., beliefs or schemas pertaining to the

psychological significance and meaning of job attributes). Along similar
lines, while there appears to be a strong tendency toward maintaining con-
sistency between cognitive and evaluative components of attitudes (Triandis,
1971), there also appears to be a greater need for consistency (and thus
more potential for distortion) if the attitude is central to the individual's
general belief system (Fishbein & Ajzen, 1975). If job satisfaction is
viewed as central to the belief systems of most individuals, then job satis-
faction should have a comparatively strong effect on job perceptions. The
research again supported this perspective.

In summary, a causal inference that job satisfaction affects job per-
ceptions, within the framework of a reciprocal causation relationship, not
only was supported by the empirical data but also is consistent with many
attitude theories.   Moreover, as reviewed earlier, this causal inference is
consistent with theoretical perspectives of social learning and cognitive
social learning theory (Bandura, 1978; Stotland & Canon, 1972), perception
(cf. Erdelyi, 1974), environmental psychology (Ittleson et al., 1974), and
some aspects of the perceived work environment literature (cf. James et al,,
1978; Salancik & Pfeffer, 1978). Thus, it is recommended that job satis-
faction be viewed as a cause of higher-order job perceptions in the future.

Causes of Job Satisfaction

Consistent with the above perspectives, job satisfaction was described
as an affective/emotional evaluation of job/task events, although it was
predicted later that individuals rely on the psychologically significant and
meaningful perceptions of job challenge, autonomy, and importance for direct
information in the formulation of job satisfaction attitudes (Hypothesis 4).
In addition, in comparison to the job perceptions, job satisfaction was

viewed as more personalistic and emotional and as requiring additional stages of cognitive information processing. Thus, it was also predicted that job satisfaction would not be affected directly by the situational attributes. Finally, it was predicted that individuals would be predisposed to have positive/negative affect toward a job in the interest of increasing, maintaining, or confirming a cognitive congruency with more basic values, beliefs, and norms (Hypothesis 3).

The results of the 2SLS analysis and the tests of logical consistency provided strong support for both Hypotheses 3 and 4. It was indicated that job satisfaction was influenced causally by the job perceptions, where a job that was perceived as more challenging, autonomous, and important was also regarded as more satisfying. As discussed previously, job satisfaction was believed to be caused directly by these higher-order job perceptions because such perceptions convey opportunities to satisfy needs for mental challenge, self-determination, and recognition. It was also found that individuals who were more favorably disposed toward their jobs, as reflected by higher levels of job involvement and compliance with conventional work norms, higher probabilities for promotion, and higher ages, were more likely to be satisfied with their jobs. In contrast, more highly educated individuals, who may well have greater mobility in the job market, were not as satisfied with their jobs. Finally, job satisfaction did not appear to be caused directly by any of the job/structure variables, thus supporting the contention that job satisfaction, in comparison to the job perceptions, requires additional stages of cognitive information processing.

An additional analysis not reported previously addressed the question of whether the situational attributes had "indirect" causal effects on job satisfaction; that is, whether the situational attributes affected job

satisfaction by way of the job perceptions. The estimates of the indirect effects were, without exception, nonsignificant (this was also true for all other estimable indirect effects in the structural model). Consequently, the genrally accepted belief that individuals respond to perceptions of environments, and not to the environments per se, received strong empirical support in this study (cf. Ekehammar, 1974; Endler & Magnusson, 1976; Hackman & Lawler, 1971; James et al., 1978).

The Implications of Reciprocal Causation and Future Research

The results supported the position that higher-order job perceptions and job satisfaction are reciprocally and dynamically related, where the variables representing one construct reflect the causal influences of the other construct (James & Jones, 1974; James et al., 1978). It is recommended, therefore, that models which portray psychologically meaningful job perceptions as unidirectional causes of job satisfaction (e.g., Hackman & Oldham, 1976) be revised to add a reciprocal job satisfaction → job perception causal link.

Another point of interest is that job satisfaction appeared to be a stronger cause of the job perceptions than vice-versa. While a sampling distribution does not exist for testing the significance of the difference between $\tilde{B}_{12}$ and $\tilde{B}_{21}$ (.34 and .14, respectively), it would seem that a .34 is substantively larger than a .14. Thus, while the job perception-job satisfaction relationship appears to be reciprocal, it does not appear to be symmetric.

A possible explanation of this finding is provided by viewing job perceptions and job satisfaction from the perspective of newcomers' acclimations to work environments. When newcomers enter a work environment, percep-

tions tend to be relatively descriptive and emphasis is placed on reality testing and developing a homeostatic fit with the environment (Schneider, 1975; Wanous, 1977). At this time, evaluations of satisfaction and dissatisfaction may be closely tied to descriptive (lower-order) perceptions (i.e., the causal flow is primarily from perception to satisfaction). Through time and experience, however, lower-order, descriptive perceptions give way to the more generalized and abstract higher-order perceptions (i.e., general beliefs or schemas about environments), and dynamic, reciprocal associations between these perceptions and evaluations of job satisfaction become stronger (James et al., 1978; Jones & Gerard, 1967: Stotland & Canon, 1972). Furthermore, as the reciprocal relationships between perceptions and job satisfaction strengthen, job satisfaction may serve as a major cognitive filter which guides recall of situational events when individuals are asked to describe work environments (Mahoney, 1977; Stotland & Canon, 1972). This suggests that as individuals pass from the newcomers stage to the equilibrium-type condition, the primary causal flow may reverse itself and job satisfaction becomes a stronger cause of perceptions than vice-versa.

The explanation above is speculative and in need of empirical examination. In addition, it is oversimplified in that it does not address what newcomers bring with them to work environments (e.g., expectations, previously formulated beliefs -- cf. James et al., 1978; Wanous, 1977). Nevertheless, it is consistent with basic cognition/perception and attitude theory (cf. Stotland & Canon, 1972), and provides a starting point for future research.

The job satisfaction → job perception causal inference also implies that job perceptions involve affective/emotional/evaluative components.

Consequently, it is recommended that a simple descriptive versus affective (evaluative) dichotomy (cf. Payne et al., 1976) be rejected as the sole basis for distinguishing between job perceptions and job satisfaction. This does not imply, however, that job perceptions and job satisfaction are indistinguishable constructs. The results of this study provided a clear basis for differentiating between the constructs in that (a) the job perceptions, but not job satisfaction, were caused directly by the situational attributes, and (b) job perceptions and job satisfaction had unique individual characteristic or demographic variable causes. Thus, in accord with prior discussion, it is recommended that job perceptions and job satisfaction be distinguished on the basis of comparative differences, where job perceptions are regarded as generally, but not totally, descriptive, and job satisfaction is regarded as generally affective and a result of additional cognitive information processing.

The results also had implications for whether job perception, job satisfaction relationships are moderated by such things as higher-order needs (e.g., achievement motivation), self-concepts (e.g., self-esteem), job involvement, compliance (which contains items similar to Protestant Work Ethic scales), and age (a covariate of tenure) (cf. Hackman & Oldham, 1975, 1976; Katz, 1978; Locke, 1976; Wanous, 1974). As noted earlier, empirical studies have not furnished strong support for the moderator approach. A possible reason for this state of events is that, with few exceptions, little attention has been given to the perceptual/cognitive basis of job perceptions in the moderator studies. That is, moderator studies typically employ job perceptions as the independent variables, and while it is noted often that the perceptions may not be veridical, no

attempt is made to ascertain how and why the job perceptions occurred (for exceptions see Hackman & Lawler, 1971: Jones & James, in press; Jenkins et al.,1975; Rousseau, 1977, 1978). The present study proposed an alternative to the traditional moderator approach, namely that many of the variables that have been thought to be moderators were instead direct causes of at least one of the constructs. This prediction received empirical support; in fact, only one individual characteristic, exogenous variable (importance of challenge) failed to have a significant direct effect on one of the endogenous variables.[5] Thus, while it is not proposed that moderator approaches be dismissed, it is proposed that job perceptions are related directly to job satisfaction.

Future research might address (a) whether the structural model employed in this study generalizes to other samples and to multiple waves of measurement on the same sample; (b) whether reciprocal causation is a viable concern for other types of variables, such as other environmental perceptions and attitudes, behavior, and person-situation interfaces (cf. Bandura, 1978; Endler & Magnusson, 1976; James et al., 1978); and (c) other potential causes of job perceptions and job satisfaction (Landy, 1978; Locke, 1976). It is noteworthy that other variables were available for use, but were not included in the structural model because their causal implications were not clear (e.g., sex, race, marital status, number of dependents -- cf. Weaver, 1978). Secondary analyses demonstrated that these variables had low and generally nonsignificant correlations with both endgoenous variables. Nevertheless, it was noted previously that the explanatory power of the structural model employed in this study had room for improvement, and thus other causes of job perceptions and job satisfaction need to be identified.

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Footnotes

[1] Different individuals might not use the terms challenge, autonomy, and importance. This is acceptable as long as synonyms which convey the same meaning are employed. In addition, the construct validity of the measures of the job perceptions employed in this study has been demonstrated in prior research (Hornick, James, & Jones, 1977; James, Haterman, Stebbins, & Jones, 1977; Jones & James, in press).

[2] Most of these variables were included in this study and were shown to have moderate to high correlations with age. The separate variables were not included in the analyses in order to avoid a multicollinearity condition.

[3] The decision to combine items to form composites was based on the interitem or average interitem correlation of conceptually related items (using Fisher z transformations) when the number of items was five or less. The required (average) intercorrelation was set at .20 or greater, which is consistent with the logic that the items were sampled from the same domain

(Nunnally, 1967). For six or more items, coefficient alpha was used as an indicator of the internal consistency form of reliability. Coefficient alpha was not employed for five or less items because this statistic is highly senstive to the number of items and can underestimate internal consistency when only a few items are used (cf. Lord & Norvick, 1968).

[4]Other types of scales often employed as job/task dimensions were not in-cluded here because they are considered to be more meaningfully placed in other domains of psychological climate. For example, perceptions of various forms of feedback comprise integral parts of our role ambiguity and role conflict scales.

[5]Moderator analyses, using either individual or situational moderators, were not conducted in this study because for a variable to take the role of a moderator, it should have low relationships with the variables it is moder-ating (Abrahams & Alf, 1972). With one exception, low relationships were not indicated inasmuch as each of the exogenous variables had an estimated parameter value $\geq |{+}.15|$ or a zero-order correlation $\geq |{+}.21|$ with one of the endogenous variables. The one candidate for a moderator, importance of job challenge for performance and satisfaction, had a marked negative skew (see Table 3), which might explain its failure in the 2SLS analysis, and questions its use as a moderator.

Table 1

Descriptive Data for Five Nonsupervisory Subject Subsamples

Subsample	$\underline{n}$	Age	Tenure	Education	Female to Male Ratio	Number of Workgroups[b]	Return Rate
Information Systems - Programming	126	36.5	1.5	15.0	1/3	21	88%
Information Systems - Nonprogramming	53	34.8	1.6	13.4	1/5	8	88%
Firefighter	288	37.5	7.0	12.6	0[a]	112	85%
Production - Line	205	34.1	3.5	11.2	1/5	23	80%
Production - White Collar	74	41.9	3.5	12.1	2/5	15	80%

Note. Age, job tenure, and education are reported in terms of years, where 12 years of education represents completion of high school.

a No females were employed at the time of the study.

b Number of unique workgroups in which nonsupervisory subjects were employed. Each nonsupervisory subject belonged to only one workgroup, and each workgroup had only one supervisor.

Table 2

Descriptive Information for Variables

Variables	Level of Analysis	Number of Items	Internal Consistency Indicators
Endogenous Variables			
Y_1 Job Perceptions:			
Job Challenge	Individual	6	.76[a]
Job Autonomy	Individual	5	.30[b]
Job Importance	Individual	3	.40[b]
Y_2 Job Satisfaction	Individual	7	.80[a]
Exogenous Variables			
Job Attributes and Structure:			
X_1 Job Complexity	Job	3	.52[b]
X_2 Job Pressure	Job	2	.29[b]
X_3 Boundary-Spanning	Job	2	.48[b]
X_4 Specialization	Workgroup	NA	NA
X_5 Standardization	Workgroup	3	.26[b]
Individual Characteristics and Demographics:			
X_6 Achievement Motivation	Individual	13	.71[a]
X_7 Self-Esteem	Individual	11	.68[a]
X_8 Importance of Challenge	Individual	2	.68[b]
X_9 Job Involvement	Individual	5	.28[b]
X_{10} Compliance	Individual	5	.36[b]
X_{11} Probability of Promotion	Individual	1	NA
X_{12} Education	Individual	1	NA
X_{13} Age	Individual	1	NA

Note. The three levels of analysis represented in the data were "individual" non-supervisory subjects (n = 746), job-types (n = 446), and workgroups (n = 173). NA refers to not applicable.

[a] Indicator of internal consistency based on coefficient alpha.

[b] Indicator of internal consistency based on interitem or average interitem correlation.

Table 3

Means, Standard Deviations, and Sample Comparisons

Variables	Maximum Possible Score [a]	Sample										Omega-Squared
		IS-P(n=113)		IS-NP(n=40)		FF(n=260)		PL(n=164)		PWC(n=65)		
		M	SD	M	SD	M	SD	M	SD	M	SD	
Endogenous Variables												
Y_1 Job Perceptions	±3.00	.23	2.49	-1.12	2.57	.70	1.74	-1.24	2.56	1.08	2.17	.14*
Y_2 Job Satisfaction	5.00	3.40	.69	3.38	.71	3.73	.57	3.39	.79	3.71	.64	.05*
Exogenous Variables												
Job Attributes & Structure:												
X_1 Job Complexity	5.00	4.16	.57	2.79	.76	3.84	.66	3.22	.74	3.65	.80	.24*
X_2 Job Pressure	5.00	3.58	.72	2.36	.75	3.51	.68	3.02	.68	3.20	.74	.17*
X_3 Boundary-Spanning	5.00	3.35	.84	1.64	.75	2.74	.72	2.34	.93	3.32	1.12	.23*
X_4 Specialization	----	1.85	1.46	3.43	1.99	2.00	.00	5.32	1.38	3.66	1.95	.58*
X_5 Standardization	4.00	1.72	.49	2.41	.54	2.24	.59	2.41	.56	1.98	.52	.16*
Individual Characteristics & Demog.:												
X_6 Achievement Motivation	5.00	3.91	.38	4.00	.43	3.78	.36	3.85	.41	4.06	.44	.14*
X_7 Self-Esteem	5.00	3.94	.40	3.83	.43	3.60	.36	3.55	.44	3.78	.49	.07*
X_8 Importance of Challenge	4.00	3.46	.54	3.30	.55	3.18	.46	3.21	.55	3.35	.50	.04*
X_9 Job Involvement	5.00	2.98	.59	2.94	.73	2.94	.58	2.81	.76	3.20	.64	.02*
X_{10} Compliance	5.00	4.11	.38	4.22	.48	4.07	.39	4.15	.43	4.26	.42	.02*
X_{11} Probability of Promotion	5.00	2.55	.99	2.98	1.19	2.79	1.10	2.26	1.04	2.43	1.09	.04*
X_{12} Education	----	14.96	1.54	13.40	1.52	12.62	1.63	11.18	1.84	12.09	2.35	.34*
X_{13} Age	----	36.50	7.19	34.78	8.93	37.36	9.05	33.47	10.69	41.98	11.43	.06*

Note. IS-P = information systems-programming subsample, IS-NP = information systems-nonprogramming subsample, FF = firefighter subsample, PL = production-line subsample, and PWC = production-white collar subsample. Reported subsample sizes are for individual, nonsupervisory subjects.

a The scale for Y_1 was based on the mean standard score for the three job perception composites. Scales for item composites were based on the mean of the items comprising a composite. Scales for X_4, X_{12}, and X_{13} were left free to vary.

* p < .01 on F-tests.

Table 4

Correlations Among Endogenous and Exogenous Variables Based on Nonsupervisory Subject Sample

Variable	Y_1	Y_2	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}	X_{11}	X_{12}	X_{13}
Endogenous Variables															
y_1 Job Perceptions	--														
y_2 Job Satisfaction	58	--													
Exogenous Variables															
X_1 Job Complexity	32	13	--												
X_2 Job Pressure	22	09	46	--											
X_3 Boundary Spanning	19	04	41	36	--										
X_4 Specialization	-30	-15	-42	-21	-25	--									
X_5 Standardization	-13	06	-18	-03	-11	08	--								
X_6 Achievement Motivation	26	10	00	-03	05	06	-06	--							
X_7 Self-Esteem	26	09	00	-04	09	-12	-12	54	--						
X_8 Importance of Challenge	13	-04	05	-02	06	-04	-12	37	28	--					
X_9 Job Involvement	39	39	10	03	12	-09	-04	41	29	13	--				
X_{10} Compliance	10	23	-09	-08	-05	09	00	32	15	18	25	--			
X_{11} Probability of Promotion	29	30	05	06	01	-13	-06	19	21	15	27	08	--		
X_{12} Education	-03	-18	17	02	14	-33	-24	01	16	23	-08	-12	13	--	
X_{13} Age	1?	21	08	05	1?	-16	00	01	01	-09	21	21	-18	-23	--

Note. Decimal points omitted. For $\underline{n}$ = 642, the significance levels for the correlations are .08 for $\underline{p}$ < .05 and .11 for $\underline{p}$ < .01.

Table 5

Estimates of Structural Parameters Based on Second-Stage of 2SLS

| | Endogenous Variables | | | |
| | Job Perceptions (Y_1) | | Job Satisfaction (Y_2) | |
First-Stage Estimates of Endogenous Variables	Structural Parameter	Estimated Value	Structural Parameter	Estimated Value
$\hat{y}_1$ Job Perceptions		--	B_{21}	.14**
$\hat{y}_2$ Job Satisfaction	B_{12}	.34**		--
Exogenous Variables				
Job Attributes and Structure:				
X_1 Job Complexity	C_{11}	.12**		--
X_2 Job Pressure	C_{12}	.08*		--
X_3 Boundary Spanning	C_{13}	.04		--
X_4 Specialization	C_{14}	-.12**		--
X_5 Standardization	C_{15}	-.10**		--
Individual Characteristics and Demog.:				
X_6 Achievement Motivation	C_{16}	.12**		--
X_7 Self-Esteem	C_{17}	.09*		--
X_8 Importance of Challenge	C_{18}	.05		--
X_9 Job Involvement	C_{19}	.04	C_{29}	.17**
X_{10} Compliance		--	C_{210}	.10**
X_{11} Probability of Promotion		--	C_{211}	.22**
X_{12} Education		--	C_{212}	-.15**
X_{13} Age	C_{113}	-.01	C_{213}	.13**

Note. Estimated values of the parameters are standardized regression weights.

* $p < .05$.

** $p < .01$.

Table 6

Logical Consistency Tests for Job Perceptions

Variables Not Expected to Have Direct Causal Relationships with y_1	Zero-Order-Correlation With y_1	Estimated Value of Structural Parameter Against Residual of Second-Stage y_1 Equation
X_{10} Compliance	.10*	-.10** $(C_{110})^a$
X_{11} Probability of Promotion	.29**	.03 (C_{111})

a Structural parameter

* $p < .05$

** $p < .01$

Table 7

Logical Consistency Tests for Job Satisfaction

Variables Not Expected to Have Direct Causal Relationships with y_2	Zero-Order Correlation with y_2	Estimated Value of Structural Parameter Against Residual of Second-Stage y_2 Equation
X_1 Job Complexity	.13**	.03 $(c_{21})^a$
X_2 Job Pressure	.09*	.00 (c_{22})
X_4 Specialization	-.15**	-.08 (c_{24})
X_6 Achievement Motivation	.10*	-.12* (c_{26})
X_7 Self-Esteem	.09*	-.02 (c_{27})

a Structural parameter

* $p < .05$

** $p < .01$

Figure Captions

Figure 1. A nonrecursive model relating job perceptions to job satisfaction.

Figure 1. A conceptual model relating job attributes to job satisfaction.
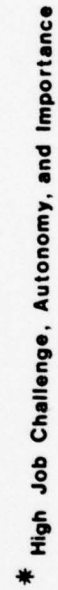
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